

IN THE CLAIMS

23. (Previously amended) A bacteria useful as a vehicle for gene transport and gene transfer to eukaryotic cells of an organism for inducing a targeted somatic transgenesis in cells, tissues or organs, except the germ-line cells of the organism, the bacteria comprising a foreign DNA integrated into an episomal vector, the transcription and expression of the foreign DNA being under the control of a eukaryotic regulator gene selected from the group consisting of a promoter and other regulatory sequence, wherein the bacteria:

- a. are vital and viable in the organism;
- b. have pathogenic properties selected from the group consisting of:
 - i. fully pathogenic;
 - ii. attenuated in one or more of the following ways:
 - (1) attenuated to prevent the bacteria from inducing apoptosis of the eukaryotic cells,
 - (2) attenuated to restrict the intracellular motility of the bacteria, and
 - (3) attenuated so as to permit efficient elimination of the bacteria after the foreign DNA is transferred to the eukaryotic cells; and
 - iii. naturally not pathogenic bacteria that is provided with additional pathogenicity factors, said factors enabling the bacteria to infect the

- organism in a controlled manner, to advance into the organs and tissue of the organism, and to transfer the foreign DNA to remote somatic cells;
- c. reach the target organ in the organism according to their typical cycle of infection and by their typical route of infection and are able to transmit the foreign DNA into remote somatic cells;
 - d. have the route of infection that is directed and locally limited either naturally or due to a specific genetic alteration of one or more genes selected from the group consisting of:
 - i. genes that influence the reproduction of the bacteria in the eukaryotic cells,
 - ii. genes that reduce the pathogenicity of the bacteria in the organism, and
 - iii. genes that inhibit the survival of the bacteria in the environment after the bacteria is excreted from the organism; and
 - e. having the cycle of infection that can be limited in time and terminated by use of an antibiotic.

24. (Previously amended) The bacteria of claim 23, wherein the promoter and other regulatory sequence originate from the previously selected target organ or are optimized from the target organ.

25. (Original) The bacteria of claim 23, wherein the bacteria further comprises an additional exogenous suicide gene.

26. (Original) The bacteria of claim 23, wherein the bacteria belongs to a genus selected from the group consisting of: Aeromonas, Bartonella, Brucella, Campylobacter, Clostridia, Enterobacteriaceae, Legionella, Listeria, Mycobacterium, Renibacterium, Rhodococcus, and a genus that is genetically or biochemically related to them.

27. (Currently amended) A bacteria useful as a vehicle for gene transport and gene transfer to eukaryotic cells of an organism for inducing a targeted somatic transgenesis in cells, tissues or organs, except the germ-line cells of the organism, the bacteria comprising a foreign DNA integrated into an episomal vector, the transcription and expression of the foreign DNA being under the control of a eukaryotic regulator gene selected from the group consisting of a promoter and other regulatory sequence, wherein the bacteria:

- a. are vital and viable in the organism;
- b. have pathogenic properties selected from the group consisting of:
 - i. fully pathogenic;
 - ii. attenuated in one or more of the following ways:
 - (1) attenuated to prevent the bacteria from inducing apoptosis of the eukaryotic cells,

- (2) attenuated to restrict the intracellular motility of the bacteria, and
 - (3) attenuated so as to permit efficient elimination of the bacteria after the foreign DNA is transferred to the eukaryotic cells; and
- iii. naturally not pathogenic bacteria that is provided with additional pathogenicity factors, said factors enabling the bacteria to infect the organism in a controlled manner, to advance into the organs and tissue of the organism, and to transfer the foreign DNA to remote somatic cells;
- c. reach the target organ in the organism according to their typical cycle of infection and by their typical route of infection and are able to transmit the foreign DNA into remote somatic cells;
- d. have the route of infection that is directed and locally limited either naturally or due to a specific genetic alteration of one or more genes selected from the group consisting of:
 - i. genes that influence the reproduction of the bacteria in the eukaryotic cells,
 - ii. genes that reduce the pathogenicity of the bacteria in the organism, and
 - iii. genes that inhibit the survival of the bacteria in the environment after the bacteria is excreted from the organism; and

¶ e. having the cycle of infection that can be limited in time and terminated by use of an antibiotic;
wherein the bacteria contains a dapE gene having a nucleotide sequence set forth in SEQ ID NO. 1 ~~or a gene matching in at least 50-60% of the nucleotide positions with the dapE gene~~, wherein the dapE gene or the matching gene is deleted or inhibited by blocking or mutation.

28. (Original) The bacteria of claim 27, wherein the bacteria is of strain *Listeria monocytogenes*.

29. (Currently amended) A bacteria useful as a vehicle for gene transport and gene transfer to eukaryotic cells of an organism for inducing a targeted somatic transgenesis in cells, tissues or organs, except the germ-line cells of the organism, the bacteria comprising a foreign DNA integrated into an episomal vector, the transcription and expression of the foreign DNA being under the control of a eukaryotic regulator gene selected from the group consisting of a promoter and other regulatory sequence, wherein the bacteria:

- a. are vital and viable in the organism;
- b. have pathogenic properties selected from the group consisting of:
 - i. fully pathogenic;
 - ii. attenuated in one or more of the following ways:

- (1) attenuated to prevent the bacteria from inducing apoptosis of the eukaryotic cells,
 - (2) attenuated to restrict the intracellular motility of the bacteria, and
 - (3) attenuated so as to permit efficient elimination of the bacteria after the foreign DNA is transferred to the eukaryotic cells; and
- iii. naturally not pathogenic bacteria that is provided with additional pathogenicity factors, said factors enabling the bacteria to infect the organism in a controlled manner, to advance into the organs and tissue of the organism, and to transfer the foreign DNA to remote somatic cells;
- c. reach the target organ in the organism according to their typical cycle of infection and by their typical route of infection and are able to transmit the foreign DNA into remote somatic cells;
- d. have the route of infection that is directed and locally limited either naturally or due to a specific genetic alteration of one or more genes selected from the group consisting of:
 - i. genes that influence the reproduction of the bacteria in the eukaryotic cells,
 - ii. genes that reduce the pathogenicity of the bacteria in the organism, and

iii. genes that inhibit the survival of the bacteria in the environment after the bacteria is excreted from the organism; and

¶ e. having the cycle of infection that can be limited in time and terminated by use of an antibiotic;

wherein said bacteria containing a cspL gene having a nucleotide sequence set forth in SEQ ID NO 2 ~~or a gene matching in at least [35] 50-60% of the nucleotide positions with the espL gene~~, wherein the cspL gene or the matching gene is deleted or inhibited by blocking or mutation.

30. (Original) The bacteria of claim 29, wherein the bacteria belongs to the genus Listeria.

31. (Previously amended) A bacterial strain Listeria monocytogenes EGD Hyl_{D491A} which is deposited at the DSMZ (German Collection of Microorganisms and Cell Cultures) under the number of 11881 and is suitable for use according to claim 23.

32. (Original) A bacterial strain Listeria monocytogenes EGD Delta actA Delta plcB, which is deposited at the DSMZ (German collection of Microorganisms and Cell Cultures) under the number 11882 and is suitable for use according to claim 23.

33. (Original) A bacterial strain Listeria monocytogenes EGD Delta cspL 1, which is deposited at the DSMZ (German collection

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of Microorganisms and Cell Cultures) under the number 11883 and is suitable for use according to claim 22.

34. (Original) The bacteria of claim 23, wherein the bacteria infect udders of cows or other lactating working animals.

Claims 35-51 (Withdrawn)